



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,624	10/23/2003	Yukio Shakuda	100006-00005	5932
4372	7590	09/20/2005	EXAMINER	
ARENT FOX PLLC 1050 CONNECTICUT AVENUE, N.W. SUITE 400 WASHINGTON, DC 20036			TRAN, MINH LOAN	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/690,624

Applicant(s)

SHAKUDA, YUKIO

Examiner

Minh-Loan T. Tran

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-10, 24-27 and 34-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-10 and 24-27 is/are allowed.
- 6) ☒ Claim(s) 34-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 08/517,121.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

On page 39, line 9, change "II-VI" to - III-V- -.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 34, 35 and 37, as now amended, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131

Art Unit: 2826

USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 36 recites the broad recitation **III-V compound semiconductor**, and the claim also recites **the group V element is selected from the group consisting of P and As** which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 36 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's prior art figure 7 in view of Okazaki et al. (5,247,533).

Applicant's prior art figure 7 discloses a method for producing a semiconductor light emitting device comprising the steps of forming an Al₂O₃ insulating substrate 51; forming a GaN buffer layer (54, 55) on the insulating substrate 51; stacking on the buffer layer (54, 55) in sequence an n-type AlGaIn lower cladding layer 56, an InGaIn active layer 57, a p-type AlGaIn upper cladding layer 58, and a p-type GaN cap layer 59; forming electrode 60 on the p-type GaN cap layer 59 and separating the semiconductor wafer into plurality of LEDs by cleaving. Applicant's prior art figure 7 does not disclose the substrate is formed of III-V group compound semiconductor material. However, figure 4 of Okazaki et al. discloses a method of forming light emitting device comprising

Art Unit: 2826

the steps of forming a substrate 23 using III-V group compound semiconductor (i.e. GaN); forming a stacked of GaN compound semiconductor layers (24-27) on the GaN substrate 23 and forming the n-type electrode 28B. on the GaN substrate 23. It would have been obvious to one of ordinary skill in the art to replace the insulating substrate 51 of Applicant's prior art figure 7 by the n-type GaN substrate 23 of Okazaki et al. in order to obtain a good ohmic contact for n-type electrode 28B.

Response to Arguments

4. Applicant's arguments filed 6/27/2005 have been fully considered but they are not persuasive.

It is argued, at page 9 of the remarks, that "Independent claim 36 recites in part : wherein the buffer layers are made of n-type $\text{Ga}_w\text{In}_{1-w}\text{N}$ ($0 < w \leq 1$). Okazaki teaches using an N-type GaN buffer. Similarly, the AAPA also teaches using an N-type GaN buffer. Consequently, neither reference teaches and/or suggests that the buffer layers could be formed from an N-type GaInN material." However, since w is in the range of ($0 < w \leq 1$), when $w=1$, the compound $\text{Ga}_w\text{In}_{1-w}\text{N}$ becomes GaN, thus applicant claim 36 does not distinguish over the N-type GaN buffer layer 24 of Okazaki et al. or the N-type GaN buffer layers 54, 55 of AAPA figure 7.

Allowable Subject Matter

5. Claims 34, 35 and 37 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

6. Claims 8-10, 24-27 are allowed.

Applicant's claims 24-27 are allowable over the prior art of record because none of these references disclosed or can be combined to yield the claimed invention such as stacking GaN-compound semiconductor layers (buffer layer, lower cladding layer, active layer, upper cladding layer and cap layer) on the II-VI compound semiconductor substrate as recited in claim 24.

Applicant's claims 8 and 9 are allowable over the prior art of record because none of these references disclosed or can be combined to yield the claimed invention such as the step of forming the insulating layer is implemented by removing an oxide film over the single-crystal silicon substrate and forming a silicon nitride layer by heating under an atmosphere of nitrogen gas.

Applicant's claim 10 is allowable over the prior art of record because none of these references disclosed or can be combined to yield the claimed invention such as the step of forming the insulating layer is implemented by growing a layer of aluminum oxide.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh-Loan T. Tran whose telephone number is (571) 272-1922. The examiner can normally be reached on Monday-Friday 9:00 AM-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/690,624
Art Unit: 2826

Page 7

Mlt
09/2005



Minh-Loan T. Tran
Primary Examiner
Art Unit 2826